COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	413KEY	**SEMESTER**	**8**
COURSE TITLE	Circular Economy		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	
Laboratory exercises	1	
	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Skills development
PREREQUISITE COURSES:	• Introduction to Environmental Engineering • Research Methods I
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (tutorials)
COURSE WEBSITE (URL)	https://www.env.aegean.gr/studies/undergraduate-degree/curriculum/circular-economy/

(2) LEARNING OUTCOMES

Learning outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.* *Consult Appendix A* • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* • *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* • *Guidelines for writing Learning Outcomes*
Upon successful completion of the course students should have acquired the following: • Understand the principles of circular economy • Identify the differences between a linear and circular economy system and the dimensions of bioeconomy • Identify the main dimensions of a systems and describe flows of materials and energy • Implement LCA methodology • draw key conclusions and evaluate the implementation of circular economy practices in business and procedures

General Competences
Search for, analysis and synthesis of data and information Adapting to new situations Decision-making Working independently Team work Project planning and management Respect for the natural environment

(3) SYLLABUS

The course introduces students to basic concepts and methodological tools needed for understanding circular economy. Weekly lectures and assignments cover the following topics:

- The concept of a circular economy
  - Circular and Bio-economy concepts
  - EU Circular Economy strategy (Action plan and the new Green Deal)
  - SDGs
- How a circular economy deviates from the current linear system
  - closed loop supply chains and logistics, new opportunities
  - industrial symbiosis
  - value creation and new business models in a circular economy
  - <u>Lab activity on examples (best cases and how they could be implemented in local companies</u>
- Material Flow Analysis
  - understanding the flow of materials and energy through the economy. It uses input/output methodologies, including both material and economic information.
  - MFA is based on the law of <u>conservation of mass</u> and is an accounting methodology of goods and substances through a system.
- A systems' thinking approach
  - Biomass production - Agriculture and forestry/ food
  - Plastics
  - Energy
  - <u>Lab activity on different systems, collecting data and presenting the flows</u>
- Products
  - transition towards a circular design
  - bio-based products,
  - longer lasting products
  - <u>Lab activity on products and packaging</u>
- Life Cycle Assessment

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	The class is adapted to moodle platform provided by University of Aegean

Activity	*Semester workload*
Lectures	13 weeks. x 3 hours/week = 39
Labs	13 weeks. x 1 hour/week = 13
study and analysis of bibliography	30
educational visits	6
project	50
Course Total	***138***

STUDENT PERFORMANCE EVALUATION	Language of evaluation Methods of evaluation laboratory work 40% essay/report (project) 30% public presentation. 30%

(5) ATTACHED BIBLIOGRAPHY

- https://ec.europa.eu/environment/circular-economy/
- https://en.sev.org.gr/wp-content/uploads/2018/06/EY_Study_on_the_Circular_Economy_BRIEF-EDITION_0.pdf
- https://www.ellenmacarthurfoundation.org/circular-economy/concept